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# ***JPRS Report***

## **Telecommunications**

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# Telecommunications

JPRS-TTP-89-012

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## CHAD

### French Funds for Telecommunications Development Reported

55000051 N'Djamena INFO-TCHAD in French  
3 Jul 89 pp 9-10

[Text] Chad's telecommunications sector has experienced considerable development over the past 3 years. In response to a request from Chadian authorities, French cooperation has made a substantial contribution to the financing of various investment programs. A 24-channel, standard B earth station handles automatic routing of international telephone and telex traffic with France and semi-automatic routing with other countries. The station is located in the Goudji district and connected to the Ridina central by a microwave relay station that went into service in December 1987. It was financed jointly by the Ministry of Cooperation (gift of 125 million CFA francs), the Central Fund for Economic Cooperation (CCCE) (1.12 billion CFA francs loaned on special terms in December 1986), and International Telecommunications of Chad (TIT) (125 million CFA francs).

In order to make the investment profitable, TIT provides its customers with new telecommunications services and equipment (teleprinters, telecopiers, prepayment booths, data transmission system) for whose purchase the Central Fund granted a credit of 250 million CFA francs in July 1988. Computerization of TIT and the National Posts and Telecommunications Office (ONPT) is under way thanks to a CCCE loan of 125 million CFA francs in April 1986. Another CCCE loan of 300 million CFA francs (June 1986) to the ONPT and a subsidy of 230 million from the Ministry of Cooperation resulted in completion of construction of the N'Djamena telephone central, which has 2,400 lines. With the old central, total switching capacity is now 4,400 lines.

In July 1988, the CCCE granted the ONPT a loan of 240 million CFA francs in order to partially relieve congestion on the Ndjamenan cable network while awaiting its total reconstruction.

Credit agreements signed with the CCCE today will make it possible to complete the national satellite telecommunications project and overhaul postal services. If the quality of telecommunications service in the capital is satisfactory as a result of investments made since 1986, the situation is far different in the provinces. It is particularly difficult to communicate with the capital, Ndjamenan, from Sarh, Moundou, Abeche, and Faya, much less with other countries. This situation seriously hinders economic trade between the capital and the provinces and the administration's operation.

The goal is to establish reliable communications between the capital and the country's main economic and political centers. The technique of a satellite telecommunications system was chosen for both technical and economic reasons. The system has five parabolic antennas, with the master antenna in N'Djamena and four others in

Sarh, Moundou, Abeche, and Faya-Largeau. The Central Fund agreed to finance the project at a cost of some 2.55 billion CFA francs. Financing will be in the form of a loan from the CCCE in the amount of 1,725,000,000 CFA francs and a gift of 575 million, in addition to ONPT financing totaling 250 million CFA francs.

Efforts undertaken by the ONPT since 1983 in the sector of postal and financial services have made it possible to reorganize services, reopen 36 branch offices, restore both domestic and international routing, and resume the activities of the postal banking system. To support such action, the CCCE granted the ONPT a loan of 100 million CFA francs for the purpose of improving service in N'Djamena and the operation of financial departments. More specifically, plans include two new branch post offices in the districts of Moursal and Hille Leclerc. The installation of computerized accounting methods will make it possible to improve the capability of keeping track of money orders from the postmaster auditing center and the postal banking system.

## GHANA

### PNDC Carrying Out Master Plan for Telecom Development

55500047 Accra PEOPLE'S DAILY GRAPHIC  
in English 20 Jul 89 pp 1, 8-9

[Article by Kate Hudson, Tema]

[Text] The PNDC [Provisional National Defense Council] is carrying out a 728-million-dollar Master Plan (1987-2006) for the development of telecommunications in the country.

The 20-year plan will be implemented in four phases, Mr E. O. Donkor, Secretary for Transport and Communications, said on Tuesday.

He was speaking on a topic, "The Development of Telecommunications in Ghana" at a lecture organised by the Rotary Club of Tema at Tema.

He said the objectives of the Master Plan include establishment of long-term development targets for the telecommunications sector and setting "target standards of service for the sector of five, 10 and 20 years horizons."

The first phase called "The Second Telecommunications Project" (STP) which is already in progress, covers 1987 to 1992 and will cost 170 million dollars.

It will be funded by the Ghana Government and various donor agencies including the International Development Agency (IDA), Japan, France, Holland and Ireland.

This, the Secretary stated, includes the modernisation and upgrading of the Satellite earth station which was completed and recommissioned in May, this year.

Mr Donkor disclosed that those yet to be started included the replacement of Accra North, Kumasi, Cape

Coast, Tema, Tamale, Koforidua, and Sekondi-Takoradi obsolete exchanges with a total capacity of 42,000 lines, replacement of the rural exchanges with digital system of a total of 4,000 lines, the rehabilitation of the long distance transmission line and the Tema Coast radio station for the maritime industry.

He said under phase two which will begin in 1992, at the cost of 211.7 million dollars, 73 manual exchanges will be replaced with digital system and 37 new ones installed while the telex demand will increase by 518 lines.

Under phase three which will cost 182.5 million dollars, 17 manual exchanges will be replaced and 42 new ones installed with an increase in demand for telex by 662 lines while in phase four which will cost 217.1 million dollars, 19 manual exchanges will be replaced and 27 new ones installed and telex demand will increase by 842 lines, he added.

Mr Donkor said by the year 2001, every village in the country will have telephone facilities.

He said "the PNDC is adopting a realistic and systematic approach to revolutionise the telecommunications sector of the country" and therefore stressed the need for the funds to be used in the venture to be properly utilised.

The Secretary said financial, project and management consultant will be invited to assist the P & T management in implementing the programme.

Mr Donkor further disclosed that a second Satellite earth station working into the Indian Ocean region would be installed in 1995, adding that packet switched data network for computer communication will be introduced in the same year.

He said that a major restructuring programme is underway to split the P & T into two separate entities to make each efficient and commercially viable and advised members of the club to channel some of their investment into the telecommunication sector.

## MAURITIUS

### Indian Firm To Supply Communications Equipment

34190317z Port Louis LE MAURICIEN in French  
19 Jul 89 p 4

[Article by Habib Mosaheb]

[Text] The Indian company Bharat Electronics Limited (BEL) based in Bangalore will supply communications equipment worth 20 million rupees to Mauritius.

An agreement on the transaction was signed Friday by the president of the Tender Board, Mr Manna, and a BEL representative, Dr V. K. Koshy.

The BEL company primarily manufactures radio equipment for security forces, telecommunications equipment used in broadcasting television programs, meteorological equipment, radar systems, and electronic products.

The Indian company employs some 20,000 persons, including 4,500 engineers and technicians, in 9 factories. In addition, BEL has a research division employing no less than 1,500 engineers and technicians.

It should be pointed out that most BEL products are produced from the company's own models (designs) and technology.

Founded in 1954, BEL has a sales volume of about 5 billion rupees and is already exporting its products to Europe and the Middle East.

Under the recently signed contract, BEL will furnish equipment to MBC [Mauritius Broadcasting Corporation], the College des Ondes, and the meteorological department.

## MOZAMBIQUE

### TDM, Marconi Form Two Joint Companies

55000052 Maputo NOTICIAS in Portuguese  
8 Jul 89 p 1

[Text] In Maputo yesterday, Mozambique Telecommunications (TDM) and the Portuguese Marconi Radio Company (CPRM) established two joint companies called Teledata and Mozambique Telephone Directories. Teledata will concern itself with computerized communication services, and Mozambique Telephone Directories will publish classified directories and directories of subscribers.

The new data communication company—Teledata—will be operational within the next few months, making it possible to introduce into our country a vast range of data communication services, important examples being teleprocessing, time-sharing service, communication between computers, access to data bases, electronic transfers of funds, and remote control services.

The publishing and marketing of telephone directories will be handled by a Portuguese consortium headed by Marconi and consisting of the Portuguese telecommunications enterprises PTT [Post and Telecommunications Office] and TLP [Lisbon and Porto Telephone Network] in partnership with the TDM. It is anticipated that this joint venture will promote development of the business end of our country's activities in the fundamental area of advertising and information regarding markets.

The agreement establishing those two firms was signed by the director general of Mozambique Telecommunications, Rui Fernandes, and the chairman of Marconi, Sequeira Braga, in the presence of the deputy minister of

transport and telecommunications, Rui Lousa, and the Portuguese ambassador accredited to Maputo, Francisco Knopfly.

In his speech, Rui Lousa underscored Marconi's vast experience and familiarity with the market and realities of Mozambique and said that the two joint ventures were essential to Mozambique's economic development.

He explained that Marconi was chosen for the establishment of the two joint ventures because of a very old relationship and the fact that Marconi is a firm whose financial situation is quite stable.

Sequeira Braga said his company was betting on the development and modernization of Mozambique Telecommunications and expressed Marconi's willingness to invest significantly in that sector, both within the country and in the region, in partnership with the TDM.

## REUNION

### ORSTOM Installs Remote Sensing Station

55000050 Port Louis THE SUN in French  
10 Jul 89 p 6

[Article by Jacques Baudeneau: "The Earth Under Surveillance"]

[Text] To meet the needs of the Indian Ocean tuna project and to monitor the marine environment with particular attention to cyclones that trouble the region as of November, ORSTOM (the French institute of scientific research for cooperative development) [Bureau of Overseas Scientific and Technical Research] has installed a highly sophisticated remote sensing station on Reunion. The station has been operational since the end of January 1989.

By a just turn of events, we can now observe our planet globally from a distance thanks to artificial satellites, whereas traditionally, we observed other planets with optical instruments from Earth, but had only incomplete, on-site measurements of the Earth itself.

Remote sensing is the acquisition of information about an object or a phenomenon without any contact between the sensor and the target. The sensor records and analyzes the radiation that objects reflect, from ultra short-waves to radio waves.

The so-called passive sensor (a camera, for example) merely receives the radiation given off. The SPOT I satellite uses this type of sensor. The active sensor (radar, for example) itself emits a signal from space that the target on Earth sends back in modified form.

Among the observation satellites used in remote sensing are METEOSAT II (geostationary at an altitude of 36,000 km), SPOT I (orbiting at an altitude of 700-950 km), and the orbiting TIROS meteorological satellite.

The first link in the chain is the NOAA (National Oceanic and Atmospheric Agency) unit that directly receives satellite data. Next, software known as TEIS (Processing and Exploitation of Satellite Images) processes the images received using MATRA SUN hardware. The data are stored on a digital optical disk for the purpose of gradually building a data bank.

Extraordinarily spectacular images are viewed at the station on a high definition color screen (2,000 lines as compared with 600 lines on a television set, 16 million colors [as published]).

The screen, which is made by the French company SEP, allows several thousand pieces of information to be viewed simultaneously by manipulating plane coordinates, color and time (image animation). Remote sensing draws on these different dimensions for research in a variety of fields that includes archaeology, agriculture, mathematics and oceanography.

It can also produce four-color "scenes" representing ground areas (2,500 by 2,500 km<sup>2</sup> for the NOAA system) on an electrostatic plotter as well as cartographic documents of areas scanned by SPOT. The ORSTOM team has been able to produce "space maps" on a scale of 1:50,000 since July 1988.

ORSTOM began working in aerial radiometry in 1970 and reached an advanced level beginning in the 1980s enabling it to participate in international scientific symposia on remote sensing. In its own work, it applies remote sensing primarily to cartography, hydrology, and oceanography.

It hopes that the remote sensing station in Reunion will become a data processing center for the entire zone, accessible to all. Proposals of collaboration are on the horizon. Thus, the Reunion station, like the one in Noumea where Americans and Australians are already working with ORSTOM equipment, is open to all potential users.

## INTER-ASIAN AFFAIRS

### ASEAN Approves Fiber-Optic Cable Network

AN890234 Chichester *INTERNATIONAL  
TELECOMMUNICATIONS INTELLIGENCE*  
in English 16 Jun 89 p 2

[Unattributed article: "ASEAN Submarine Fibre-Optic Cable Network"]

[Text] From 29-31 May, members of ASEAN (Association of South-East Asian Nations) telecommunications administrations and representatives from some 50 of the world's largest telecommunications corporations attended a meeting in Singapore to discuss further the proposed ASEAN submarine fibre-optic cable network. The member countries of ASEAN (Brunei Negara Darussalam, Indonesia, Malaysia, Philippines, Singapore, and Thailand), endorsed the submarine fibre-optic cable network at the 12th Meeting of the ASEAN Sub-Committee on Posts and Telecommunications, held in Jakarta in August, 1988. Costing around S\$550 million (US\$282 million), the network will include the use of the latest optical-fibre technology and will have twice the capacity of the cables currently in use. It will have high-speed transmission rates of up to 560 Mbit/s, and capacity of each of the eight segments is expected to exceed the equivalent of 3,800 telephone channels. With this high-speed capability, the ASEAN network can carry television and videoconference signals which are presently possible only via satellite. Completion of the first three segments of the cable network are scheduled for the end of 1991. They will connect Brunei Darussalam, Malaysia, Singapore, and the Philippines. The entire network will be completed by 1995 and will link all ASEAN countries. The ASEAN network will be linked to North America via the Guam-Philippines-Taiwan (GPT), Transpacific 3/Hawaii 4 (TPC3/HAW4), Hong-Kong-Japan-Korea (H-J-K), Transpacific 4 (TPC 4), and North Pacific Cable (NPC) cables; and to Europe via the proposed South East Asia-Middle East-Western Europe

II cable (SEA-ME-WE II) between Singapore and France, for which a feasibility study is being conducted by Singapore Telecom and France Telecom. At the meeting more than 20 international telecommunications entities revealed an interest in investing in the ASEAN submarine fibre-optic network. Details will be finalised with potential investors at further meetings.

### Japanese Firms Awarded ASEAN Cable Project

AN890258 Chichester *INTERNATIONAL  
TELECOMMUNICATIONS INTELLIGENCE*  
in English 7 Jul 89 pp 2-3

[Article: "Contract Awarded for Malaysian Section of ASEAN Project"]

[Text] Malaysia's Syarikat Telecom Malaysia Corp has awarded a group of Japanese companies a ¥7 billion (approximately \$50 million) contract to construct a submarine fibre-optic telecommunications cable between Kuantan on the east coast of the Malaysian peninsula and Kota Kinabalu in Sabah state on the island of Borneo.

Mitsui & Co Ltd and NEC are joint prime contractors for the turnkey contract, which is the first phase of the long-term ASEAN (Association of South-East Asian Nations) project to link member countries by fibre-optic telecommunications cable. Mitsui will be responsible for the overall project management, while NEC will undertake the comprehensive system integration, equipment design and supply. Subcontractors include Ocean Cable Co Ltd, which will supply and lay fibre-optic cables along the route, and Fujitsu, which will be providing communications equipment.

Spanning 1500 km, the cable will accommodate 11,520 telephone channels with transmission speeds of 420 Mbit/s.

This first phase is scheduled for completion in November 1990. The entire ASEAN network will be completed by 1995.



## HUNGARY

### **Hungarian Firm To Manufacture Ericsson Equipment**

*AN890260 Chichester INTERNATIONAL  
TELECOMMUNICATIONS INTELLIGENCE  
in English 7 Jul 89 p 7*

[Article: "Licensed To Manufacture"]

[Text] The Swedish telecommunications giant, Ericsson, has reached an agreement with Videotron Electronic of Hungary, under which the Hungarian company will manufacture telecommunications equipment of Ericsson's design within Hungary.

Ericsson sees the need to continue building the basic telecommunications network (600,000 Hungarians are currently waiting for a telephone connection). The company asserts that most developments made to the Hungarian telephone network today are based on Ericsson equipment manufactured under licence.

A significant breakthrough for Eastern Bloc countries and Western manufacturers was achieved last autumn, when COCOM (Coordinating Committee on Multilateral Export Controls) lifted a 4-year-old ban on sales of some digital telecommunications products, including digital public exchanges and digital PABXs, to Comecon countries. Within weeks of the COCOM announcement, Hungary had signed a SKr47-million (\$7.16 million) order with Ericsson for the supply of an AXE international exchange in Budapest. This first fully digital telephone exchange to be deployed in Eastern Europe was manufactured in Sweden.

## POLAND

### **Japanese Assist In Setting Up Intelsat II Satellite in Poland**

*55003002 Warsaw RZECZPOSPOLITA in Polish  
24-25 Jun 89 p 4*

[Article by (mk): "Intelsat II in Psary; Communications With Japan in the Fall"]

[Text] The assembly of the electronic equipment for a new Intelsat II satellite system will begin on Monday, 26

June, at the Center for Satellite Communications in Psary, near Kielce. This will permit communications with Australia, Indochina and Japan via a satellite stationed over the Indian Ocean.

This will be the fifth operating station at the Polish [Administration of] Posts, Telegraphs and Telephones Center for Satellite Communications. Two Inmarsat system stations, one Intersputnik system station and one Intersat system station are currently in operation at the Center. The first antenna operating with the Intelsat system has been functioning since 1982 and assures communications with the nations of the Atlantic Ocean region. But the Intelsat II will permit the transmission and reception of information to and from the countries of the Indian Ocean basin via over 1000 telephone lines and two TV channels.

A Japanese firm, NEC, is supplying the equipment and supervising the assembly of the new station. Mechanical regulation of the assembled antenna was accomplished between 15 May and 15 June with the assistance of Japanese professionals. The new Intelsat II station will begin operating when the electronic equipment will be installed at the end of September and the beginning of October.

Wieslaw Dzierzak, director of the Center, predicts that the foreign exchange costs incurred by this investment will be returned in 12 to 18 months. An investment of this type is so profitable that another satellite station is being considered even before the Intelsat II is in operation. Studies are continuing on participating in Eutelsat, the European satellite communications telephone system that was created in 1984 to encompass all Europe and the Mediterranean Basin. Poland was the first socialist country to join Eutelsat. The satellite station for the system will be financed by World Bank credits. Currently, however, its location is undecided. Wieslaw Dzierzak opines that the Center in Psary has the most advantages, including space to construct another primary station and qualified technicians.

Despite the unqualified successes of the Psary Center and the achievements in developing satellite communications, one cannot help but be aware that very soon it will be easier to communicate with Osaka than with a neighboring district. Assuming, of course, one lives long enough to get a telephone.



## INDIA

**Satellite Troubles Indicate Laxness in Manufacture**

55500113 Calcutta *THE SUNDAY STATESMAN*  
in English 25 Jun 89 p 8

[Article: "Evil Eye in the Sky?"]

[Text] The extensive damage caused to the INSAT-1D by an accident in the USA has raised fears about a serious disruption of India's satellite transmission programmes which are used in a variety of services, including radio and television programmes, weather forecasts and telecommunications. The \$140 million satellite was to have been launched by the end of this month to replace the ageing INSAT-1B, whose effective life is expected to come to an end in September. But in view of the latest setback, it seems that, for September onwards, India will have to depend almost entirely on the crippled INSAT-1C, which has not been functioning properly since last year because of a power failure on board. Problems such as these would seem to suggest that the entire INSAT programme is jinxed. For a start, the first satellite in the series, the INSAT-1A, had to be written off soon after it was launched in 1982 because its solar panels failed to open despite repeated efforts by scientists on the ground. Even its replacement, the INSAT-1B, which is the only satellite in the series which has been fully operative since being launched in 1983, was plagued by a great deal of trouble in the initial stages.

For instance, it was hit by an unidentified object—perhaps a meteorite—soon after being released from an American space shuttle. Then, in a tense re-run of its predecessor's problems, the INSAT-1B's solar panels, too, failed to open. In the end they did unfurl, but only after a number of apparently unscientific methods of persuasion—including "soaking" the satellite in the sun for six days and then vigorously shaking it—were tried. Clearly, the shaking demonstrated a measure of desperation among the scientists. It is just as well, therefore, that INSAT-1B could finally be made to function because its successor, the INSAT-1C, has had a troubled life right from the beginning. Its launch was delayed, for instance, because of the space shuttle tragedy in 1986, and then it became a victim of the kind of power failure which had taken place in other Indian satellites like Aryabhata, Bhaskara-I, Bhaskara-II and Apple.

Although it is well known that these sophisticated satellites are extremely delicate, the long list of their troubles seems to suggest that enough attention is not always paid to the vulnerabilities of their sensitive systems during manufacture and transport. Of the various failures, only the INSAT-1D has been a victim of an accident (which also shows carelessness in handling), but the others had major mechanical faults of a kind that points to inadequacies in manufacturing. This is particularly true of the power failures on board the INSAT-1C and the other

satellites. Obviously, if the reason for the faults in Aryabhata and the two satellites in the Bhaskara series were closely scrutinized, then the INSAT-1C might not have been rendered largely ineffective so early in life. Despite the initial reservations in some quarters about the wisdom of putting up these expensive satellites, the country has become used in the last few years to their various services. As such, the sudden deprivation in the months after September will amount to a cruel mockery of the extensive facilities that have been set up on the ground to receive the satellite transmissions.

**High Level Panel To Promote Fibre Optics Set Up**

55500112 New Delhi *PATRIOT* in English  
30 Jun 89 p 5

[Article: "High-Level Committee for Fibre Optics Promotion"]

[Text] A ten-member high-level committee was set up on Thursday to examine key issues relating to fibre optics requirements, R&D programmes, manufacturing and expansion capabilities in the telecommunications sector, reports PTI.

Though some work has been done in this area, in view of the formation of the Telecom Commission, it was felt that a fresh look was needed to formulate a national integrated plan, an official release said.

The high-level committee would be headed by Dr A. K. Ghatak of the Indian Institute of Technology, New Delhi.

It would be assisted by full-time members who would help in preparation of technical plans. The committee, which would have three meetings for detailed discussions, was expected to complete the study in 90 days.

The terms of reference of the committee are:

- to study the fibre optics requirement of various users in the country;
- to study the fibre optics R&D programmes being implemented in different institutions and organisations;
- to study the manufacturing and expansion capabilities of fibre optics cable and equipment manufacturers in the country and;
- to formulate an integrated plan for the country covering a national fibre optics network catering to the needs of various users, and integrated R&D programme with identified institutions and organisations existing or otherwise and to prepare a technology introduction plan leading to a fibred city concept.

### **Official Tells Plans To Expand Telephone Service**

55500111 Madras *THE HINDU* in English 6 Jul 89 p 3

[Article: "Five Million New Phone Connections by 1995"]

[Text] Madras, July 5—Five million new telephone connections are to be provided in the country between 1990 and 1995 with a total investment of Rs. 20,000 crores, Mr. Satya Pal, Member (Service) Telecom Commission and Secretary in the Telecommunication Department, said on Tuesday.

Inaugurating a seminar on modern methods in operation and maintenance of telecommunication networks, organised by the Asia Pacific Telecommunity, he said Rs. 2,700 crores was to be spent on telecommunication development during the current year. Of this, 73 percent would be met from surplus in telecommunication operations and the rest was being raised from the public, the Government and other sources.

Efforts were also on to increase the total number of public telephones in the country from 50,000 to one million in the next 10 years. The aim was to provide for telephone facility within a walking distance. Right now, there were 4.2 million direct exchange telephone connections of which 3.8 millions were in urban areas. The total worked out to a telephone density of five per 1,000 population.

Mr. K. K. Ramaswamy, Chief General Manager, Madras Telephones, said the seminar had been organised in the context of the need for a re-orientation of the philosophy of operations and maintenance in view of recent technological developments.

Mr. Chao Thongma, executing director, Asia Pacific Telecommunity, welcoming the gathering, said the purpose was to share experiences with the operations and maintenance systems that had proliferated in recent years. Some were equipment-specific, while many others had general and widespread applications.

About 40 delegates from 20 countries are participating in the four-day seminar. The Asia Pacific Telecommunity was established in May 1979 as a regional telecommunication organisation under the auspices of the Economic and Social Commission for Asia and Pacific by an inter-governmental agreement.

### **110 TV Transmitters Planned for Remote Areas**

BK2108141289 Delhi *Domestic Service* in English 1230 GMT 21 Aug 89

[Text] The information and broadcasting minister, Mr H.K.L. Bhagat, has said that 110 additional television transmitters will be set up in the remote areas under recently-approved crash program. He was opening a 10-kilowatt high-power television transmitter in Pune today. Mr Bhagat said Doordarshan [Indian television], which at present has 368 transmitters, will soon have over 534 transmitters.

## **PAKISTAN**

### **Satellite Ground Receiving Station Opens**

BK1708112289 Islamabad *Domestic Service* in English 1100 GMT 17 Aug 89

[Text] The prime minister, Ms Benazir Bhutto, formally opened a satellite ground receiving station about 25 km from Islamabad today. Set up by the SUPARCO [Pakistan Space and Upper Atmosphere Research Commission], the station will receive remote sensing data from satellites and orbiting spacecraft for use in various fields. These include identification of mineral deposits and natural resources; management of water resources; control of waterlogging and salinity; agriculture, environment, and pollution studies; and cartography.

Before the prime minister unveiled the plaque of the ground station, she was given a detailed briefing by the SUPARCO chairman and was shown around various sections of the station.

## **SUDAN**

### **Radio-Telegraph Equipment Arrives**

EA0808210489 Omdurman *Domestic Service* in English 1500 GMT 8 Aug 89

[Text] The minister of transportation and communications, Sa'id Ali Ahmad Abd-al-Rahim, announced that two-way transmission radio-telegraph equipment has arrived in the country by a loan of the Arab Fund for Economic and Social Developments amounting to about \$1,000,000. The minister said that the public post and telegraph corporation, in collaboration with the public telecommunication corporation, is preparing to install this equipment in the western Sudan area. The minister also announced the arrival of telex equipment as part of the development program. This will be installed at regional and provincial headquarters.

## EUROPEAN AFFAIRS

### EC Urges Closer Coordination on ISDN

*AN890272 Luxembourg OFFICIAL JOURNAL OF THE EUROPEAN COMMUNITIES in English No C196, 1 Aug 89 pp 4-6*

[“EC Council Resolution of 18 July 1989 on the Strengthening of the Coordination for the Introduction of the Integrated Services Digital Network (ISDN) in the European Community up to 1992”]

[Text] The Council of the European Communities,

Having regard to the Treaty establishing the European Economic Community,

Having regard to the proposal from the Commission,

Whereas Recommendation 86/659/EEC provided administrations and the recognized private operating agencies offering telecommunications services (hereinafter referred to as “telecommunication administrations”) with a focal point for ISDN implementation planning; whereas reported plans demonstrate a recognition of the value of compliance with the said recommendation’s programme;

Whereas the telecommunications administrations have indicated their intention to strengthen the abovementioned programme by the recent signing of a Memorandum of Understanding for the realization of a Europe-wide ISDN system as from 1992;

Whereas the Green Paper of 30 June 1987 and the communication of 9 February 1988 on the implementation of the Green Paper have defined policy and advanced a schedule of measures towards the completion of the common market in telecommunications;

Whereas Resolution 88/C 257/01 set the political basis for the development of the common market for telecommunications services and equipment up to 1992;

Whereas the communication from the Commission of 31 October 1988 included the first annual progress report concerning the implementation of Recommendation 86/659/EEC;

Whereas ISDN has gained substantial credibility in the Community with users, industry, and telecommunications administrations;

Whereas ISDN is beginning to fulfil its promise of developing into a new basis for the Community’s telematics market of the early nineties;

Whereas, despite these positive achievements, the major objectives of Recommendation 86/659/EEC have been achieved only in part;

Whereas substantial problems remain concerning standardization and the further coordination of the introduction of ISDN; whereas they must be resolved;

Whereas, in particular, the Memorandum of Understanding on Pan-European Mobile Communications is already in existence, and should be taken into account in the coming ISDN implementation with a view to ensuring the necessary integration;

Whereas the Commission has proposed a number of measures in order to remedy the current deficiencies;

Whereas these proposals have been discussed in the Senior Officials Group on Telecommunications (SOGT) and at the informal meeting of Telecommunications ministers in Athens on 5 November 1988,

### Recognizes the Existence of a Unique Opportunity To Create the Conditions for:

The availability of a sufficient set of truly Europe-wide compatible ISDN services by 1992, building on the initial phase of introduction of ISDN;

The end-to-end compatibility of those services and the availability of low-cost terminals, which can be connected to, and operated with, the ISDN implementation in any Member State, without any modification (terminal portability);

The optimization of the competitiveness of the European terminal equipment industry, including PABXs (private automatic branch exchanges) and the full integration of the less-favoured regions of the Community in the emerging ISDN, by appropriate measures, in accordance with the Star programme,

### Considers the Following Measures as Necessary:

Acceleration of the establishment of common specifications, based on European standards taking due account of worldwide standardization, for equipment and interfaces at the European level, by concentration and good use of available resources within the framework of the European standardisation system and, in particular, of the European Telecommunications Standards Institute (ETSI);

Seeking of a commitment from manufacturers to contribute, within the framework of European standardization and as rapidly as possible, to the development of European standards and common specifications for terminals and PABXs; such standards and specifications should make it possible to guarantee end-to-end compatibility and terminal portability;

Subject to the procedures of the framework directive once adopted, examination of the applicability of the relevant aspects of Open Network Provision (ONP) to ISDN;

Further discussions at European level regarding user privacy protection requirements and requirements concerning the security of communications in the context of features of new services, in accordance with the resolution of the European Parliament of 12 December 1986 on Recommendation 86/659/EEC,

**Invites the Telecommunications Administrations:**

To implement the Memorandum of Understanding agreed between the telecommunications administrations (see Footnote) on the provision of at least a minimum set of pan-European ISDN services and features and on the introduction of a common ISDN signalling system; telecommunications administrations should take account of Community competition rules, progress on standards, and the objective of the creation of an open Community-wide market for telecommunications services for all market participants, particularly for value-added services; information on the implementation of this Memorandum should be communicated to the Commission in time,

**Invites the Commission and the Telecommunications Administrations:**

To undertake all necessary efforts to strengthen the further coordination for the introduction of ISDN in the European Community;

To intensify the consultations between the telecommunications administrations of all Member States on the implementation of the coming period of ISDN specification work and implementation, with the objective of the opening of a set of pan-European commercial services available before 31 December 1992;

**Invites the Member States:**

To promote the provision of the experts necessary for drawing up European standards as the basis for the common specifications for ISDN, in particular in the framework of the ETSI, and promote the creation of the necessary conditions, in particular with regard to training;

**Invites the Commission:**

To invite the directors-general of the Telecommunications Administrations to take part in meetings with the Commission, when appropriate, in order to discuss questions and problems which may arise concerning the coordination of the introduction of ISDN, in particular aspects of pan-European services;

To issue mandates to ETSI in addition to the adopted work programme as necessary and appropriate for the acceleration of the production of European standards as the basis for common ISDN specifications, in accordance with existing Community procedures;

To consider, subject to the procedures of the framework directive once adopted, the applicability of the relevant aspects of the ONP to ISDN;

To evaluate the feasibility of joint research and development deemed necessary for the implementation of common terminals for a single or for several ISDN services in the appropriate framework;

To examine the possibilities for stepping up future support for the implementation of ISDN in the less-favoured regions of the Community, taking into account, in particular, the results of the evaluation of the Star programme.

**Footnote 1.**

Opened for signature at the meeting of the European Conference of Postal and Telecommunications Administrations (CEPT) telecommunications commission in London on 6 April 1989.

**CANADA**

**Special Rates for Teleglobe Provoke Controversy**

55200052 Toronto *THE GLOBE AND MAIL*  
in English 3 Aug 89 pp B1, B4

[Article by Lawrence Surtees, *THE GLOBE AND MAIL*]

[Text] Big business customers and domestic telecommunications carriers are divided over whether Teleglobe Canada Inc. should receive special treatment in its dealings with telephone companies.

The differences surfaced in an inquiry begun in March by the Canadian Radio-Television and Telecommunications Commission to look at the special tariffs negotiated between Bell Canada and Teleglobe.

The agreements relate to special services Bell provides to Teleglobe at very low rates to handle the large volume of international calls to or from Canada or calls between other countries that pass through Canada.

The rates under the new contracts are about 10 times lower than the prices charged to businesses for the most comparable service. "We've provided these services to Teleglobe for many years in this fashion," said Jim Schram, Bell's assistant vice-president for private network services. He added that the agreements have nothing to do with the purchase of an equity stake in Teleglobe Canada's parent company, Memotec Data Inc., by Bell's parent, BCE Inc.

Business users oppose the rates Bell charges Teleglobe for the dedicated bulk channel services. Each of the so-called DS-3 circuits can handle the equivalent of 672 telephone lines simultaneously. Unlike the T-45 service in the United States, however, it is not yet available to corporate customers in Canada.

Business users are also irked by comparisons in Bell's filings between Teleglobe's service and a comparable business service. For example, Teleglobe will be charged \$156,570 a month for 10 super-groups between Montreal and Vancouver, compared with \$1.1-million that customers would pay for comparable Telpak lines.

Although the CRTC has approved the special agreements between Teleglobe and the federally regulated

carriers, it has rarely, if ever, asked for comments on the special tariffs negotiated under them.

The special tariffs are renegotiated every five years by Teleglobe and are put out to tender to the phone companies and to CNCP Telecommunications of Toronto. Bell won the last tender, leading to the CRTC proceeding, Mr Schram said.

Many competing interests are at stake in the proceeding.

In tackling the issue, the CRTC is asking whether Teleglobe Canada should receive special treatment from the carriers and whether the services in the special tariffs should be made available for the same fee to any other user.

At stake for Bell and the other federal carriers, including CNCP Telecommunications and British Columbia Telephone Co., is a lucrative chunk of business that comes from helping Teleglobe handle international messages. The rates charged by domestic carriers determine whether Teleglobe is competitive in moving international messages between other countries through Canada.

The proceeding has also opened up issues of telecommunications competition between the phone companies and smaller, struggling resellers, such as Marathon Telecommunications Corp. of Vancouver, which want access to the DS-3 services. Big corporate users also argue that they will turn a lot of traffic through the United States if they can't get the same services in Canada.

Teleglobe needs to hook up with domestic carriers to send and receive international telephone calls to and from Canada. But it also handles a growing amount of traffic between other countries.

"Geographically, Canada is well placed to continue to provide transit arrangements between the European community and the Pacific Rim countries," said Jules Lamay, director of regulatory and corporate analysis at Teleglobe, in a brief to the CRTC.

Teleglobe's rates have to be competitive with U.S. companies or with alternative facilities provided by international consortiums, such as Intelsat.

Teleglobe fears that the CRTC's rulings could "have a profound effect on the manner in which overseas telecommunications services are provided," Mr Lamay stated. If the CRTC doesn't allow Bell's price breaks, Teleglobe could lose the transit traffic, the company argues.

Teleglobe is also relying on a policy statement made by the federal government when it sold the company to Memotec in April 1987, that promised to keep Teleglobe's arrangements with other carriers intact.

Those arrangements are in the domestic carrier's interests because they also get a piece of revenue from each international call that moves through their facilities or territory.

However, many big business customers oppose the special rate being given to Teleglobe. While agreeing that Teleglobe is a "unique" customer, Hudson's Bay Co. says business customers object to paying "a higher rate for less service."

## CYPRUS

### New Telecommunications Network Inaugurated

55002478 Milan *SISTEMI DI TELECOMUNICAZIONI* in Italian 5 May 89 p 70

[Unsigned article: "New Digital Telephone Network Inaugurated on Cyprus"]

[Text] The new telecommunications network on the island of Cyprus, which uses digital telephone exchanges, the AXE 10 System supplied by FATME of the Setemer-Ericsson group, has been officially inaugurated in the presence of the Greek Cypriot minister of labor and communications, Mr N. Protopapas; the Italian ambassador to Cyprus, Guido Rizzo Venci; the president of the Cyprus Telecommunications Authority (CYTA), Mr N. Countas; and engineer Sergio Mercuri, general manager adviser of FATME.

The Cypriot network, one of the most modern installed in Europe, currently consists of 40 digital exchanges of the AXE type interconnected to the CCITT No 7 advanced signaling system. The AXE digital exchanges can provide the approximately 80,000 users now connected to it with a number of new services, such as transfer of incoming calls to another number; abbreviated dialing; documentation of debiting; intermediate calling; adding a third subscriber in a conference call; disabling sets for outgoing calls; calling a preset number (immediate or delayed), with subscriber absent; quiet service; call-waiting notification; and identification of a nuisance caller (IAD).

The contract signed by FATME in 1984, for a total amount of \$24 million, called for the supply of equipment and pertinent services to carry out the CYTA updating program over the 1984-89 period. The satisfactory operation of the AXE exchanges supplied by FATME led the CYTA to extend the contract for expansion of the exchanges already installed and for supply of other local AXE 10 exchanges and one international AXE 10 exchange, to make it possible to gain an aggregate number of about 200,000 users by 1993.

The transfer of know-how accomplished by FATME through training activities carried out in Italy and on Cyprus has enabled the CYTA to carry out dimensioning, engineering, installation, testing, and maintenance of the hardware and software supplied.

## FRANCE

### CNET Develops Flat Display Technology

*AN890233 Chichester EURO-TELECOM in English  
16 Jun 89 pp 3-4*

[Unattributed article: "PCEL Technology for Tomorrow's TVs"]

[Text] Researchers at the French Telecommunications Research Center, CNET, have developed a new flat display technology which they claim will allow production of low cost, low power, high brightness colour TV displays. The invention arose out of a search for low cost miniaturised displays for videotelephone and Minitel terminals.

For Minitel or other data terminals, use of the PCEL technology has a further advantage in that it can be literally written on using a fibre-optic light pencil. In this way it can be used as a data input device as well as providing output. It is based on several layers of insulating, conducting and active thin films deposited on a glass substrate. Two of the layers are respectively light emitting and photoconducting. Other layers in the sandwich contain conductive stripes placed at right-angles to each other forming a matrix which defines the picture elements (pixels). Each cell so formed thus has a Photoconductive (PC) and electroluminescent (EL) layer which are electrically connected in series. In the "off" state, the photoconductive layer initially offers a high resistance to control currents. When a pixel is addressed by passing currents along the conductive stripe that intersects at its location in the matrix, the photoconductive layer suddenly loses its resistance, allowing the associated electroluminescent cell to emit light. The light emitted then falls on the PC layer keeping its resistance low and maintaining light emission.

Effectively, this mechanism provides each light-emitting pixel with a memory capability which reduces the power needed to sustain a high brightness display, and eliminates flicker. It also allows individual pixels to be switched on by focussing an external light source onto them—for example, the output from the end of an optical fibre. When lit, because the resistance of the PC layer is substantially reduced, their position in the matrix forming the display can be sensed and translated to data input. Currently, workers at the CNET's Bagneux laboratories have made working demonstration arrays of 64 by 64 elements. Now they are working to build a full resolution panel with 640 by 400 picture elements. They calculate that by comparison with a "conventional" panel as used in laptop computers, for example, brightness will be increased by a factor of 2—from 25 cd/m<sup>2</sup> to 50 cd/m<sup>2</sup>—while power consumption will be cut from a typical 17 Watts to just 1.6 Watts. They say that colour displays can be made by adding additional layered pairs and the appropriate filters.

Volume production costs are also forecast to be considerably lower than competing technologies, such as thin

film transistor (TFT) driven liquid crystal, plasma or electroluminescent panels, since the manufacture of the new display does not involve expensive and time-consuming patterning with high-precision masks.

## NORWAY

### Soviets on Svalbard Linked With Norway's Phone Net

*55002473b Oslo AFTENPOSTEN in Norwegian  
11 Jul 89 p 9*

[Article by Erik Veigard: "Tele-Glasnost On Svalbard"]

[Text] Tromsø—The Russians on Svalbard have now had a taste of modern telecommunications connections, since they were recently plugged into the Norwegian telecommunications network. Now they have ordered four new lines and a Norwegian coin-operated phone.

Just a few weeks ago the Russian consulate in Barentsburg was connected to the Norwegian telephone network. For the first time, the Svalbard Russians could speak by phone with Moscow. Previously their communications were sent by way of post and short-wave transmissions. By way of the Maxim Gorky Rescue Service, AFTENPOSTEN was able to dial Barentsburg direct for the first time and ask the consulate for its comments.

Apparently, there has been a positive response the convenience of the telephone, because they have now ordered three new lines for the Russian mining company Trust Arktikugol in Barentsburg and one line for the living quarters in Pyramiden. They have also asked for a Norwegian coin-operated telephone to be placed in the new hotel that will open in Barentsburg within a few weeks.

"This is a good example of how our two countries are coming closer together up here," said Viggo Kristiansen, who is in charge of telecommunications on Svalbard. "The telephone link with the Russians helps many of us in our daily work and it is particularly important out of safety considerations," he said.

In order to establish telephone connections with Pyramiden, which until now has been limited to telegraph communications with the rest of the world, the Telecommunications Service must set up a new radio link, but that will be done this summer and it will cost only a few thousand kroner.

"We are pleased by all this progress on the telecommunications front, but we believe it is a particularly positive step that a Norwegian coin-operated telephone will be installed in Barentsburg. Now, for the first time, ordinary workers in Barentsburg will be able to call directly to their families at home in the Soviet Union, as long as they have Norwegian coins," the telephone chief said.



## Ericsson Carving Out Wide Role in Country's Telecommunications

### Mobile Phone System Contract

55002473a Oslo AFTENPOSTEN in Norwegian  
28 Jun 89 p 28

[Article by Ulf Peter Hellstrom: "Ericsson Expanding Mobile Telephone Network"; first paragraph is AFTENPOSTEN introduction]

[Text] The Swedish Ericsson group won out in tough competition with the Finnish company Nokia for a contract to produce new telephone exchanges for the Telecommunications Service's NMT [Nordic Mobile Telephone] network during the first half of the 1990's. The general agreement is valued at about 250 million kroner.

"The agreement with the Telecommunications Service is of great importance to Ericsson's business activities in Norway. It means that we at Ericsson will assume responsibility for developing the NMT system here in Norway," said Hans Lillebye, division director of Ericsson in Norway.

The Telecommunications Service hopes to increase the number of mobile telephone customers from today's level of about 250,000 to approximately 450,000 subscribers during the expansion period of 1990 to 1995.

NMT stands for the Nordic Mobile Telephone network, which the Nordic countries have been constructing since the early 1980's. Mobile telephone traffic in the Nordic countries has increased explosively, particularly in Norway, and the so-called NMT 450 network has had major problems with capacity, especially in Oslo and the other major cities.

"Further expansion of the NMT network in the 450 MHz band will help remedy this capacity problem, but the NMT network in the higher 900 MHz range will be expanded to cover the entire country," director Lillebye said.

NMT will be the main system in mobile telephony until the beginning of the next century. Subsequently, the digital mobile telephone system GSM will expand throughout Europe. This system will make it possible for mobile customers to telephone not only within Norway and the other Nordic countries, but also to subscribers in the remainder of Western Europe.

The contract with the Telecommunications Service will secure the jobs of about 40 development engineers in Hisoy, Arendal, and an additional 30 engineers will be employed for installation and maintenance.

Ericsson won the contract following an international round of bidding in which the Finnish company Nokia was the last main competitor.

## Competing For Digital System

55002473a Oslo AFTENPOSTEN in Norwegian  
7 Jul 89 p 18

[Article by Ulf Peter Hellstrom: "Digital Swede In the Hunt"]

[Excerpts] The multi-billion Ericsson group is going all out in the hunt for the major digital contract with the Norwegian Telecommunications Service, according to Ericsson's top chief, Bjorn Svedberg. If Ericsson lands the billion kroner contract, Svedberg promises more jobs in Norway, but he shies away from indicating the number.

"Ericsson can defend its position in Norway," Svedberg said. He is an optimist with regard to winning the new digital contract, which of course he is obliged to be.

As we know, earlier this summer the Norwegian Telecommunications Service solicited bids from Ericsson, Alcatel STK, and Siemens Norge for production of digital telephone exchanges during the 1990's. It is a contract worth billions and it can be do or die for the arch-rivals that dominate the Norwegian telecommunications market.

Ericsson engineers at their Norwegian headquarters in Asker and at headquarters in Stockholm are now working feverishly to examine the invitation from the Telecommunications Service, which covers over 8,000 pages. It is no coincidence that the top chief of the Ericsson group, who is celebrating his 52nd birthday this week on the American Independence Day, is paying yet another visit to his Norwegian subjects. [passage omitted]

"It would be a natural step to open several research centers in Norway," Svedberg said.

Can you promise that research and development work will be carried out by Ericsson in Norway?

"If we land the digital contract, then obviously this will mean jobs in Norway. The company has already opened some centers in Norway. This is true in the area of data communications, for example."

Can you promise jobs?

"Ericsson already employs 900 people in Norway, if you include our activities in defense technology. There is a great chance that this number will be increased," Svedberg said.

Does a small country such as Norway really have room for two types of telephone exchanges in its telecommunications network which, of course, would be the case if Ericsson should now step in after Alcatel STK?

"The Norwegian Telecommunications Service must decide that, but experience in other small markets shows that telecommunications authorities often prefer to have contracts with two manufacturers."



"The Norwegian Telecommunications Service has a good reputation, especially from the technological standpoint. And Ericsson's technology is already used in the Norwegian data and mobile telephone network. But the agency itself must make the decision."

Are you afraid that employment policy could be involved here, to the extent that pressure to keep industrial jobs in Norway could make it difficult for Ericsson?

"Our long experience with the Telecommunications Service has demonstrated clearly to us that the agency has a high degree of independence and integrity. We have every reason to believe that this decision will be based on business considerations."

"We are very hopeful of landing the digital contract with the Norwegian Telecommunications Service. It will mean jobs for Norway," Svedberg said in his formal manner.

The Ericsson chief heads a worldwide company with activities in over 70 countries. The Ericsson group is at a disadvantage compared to its other giant competitors, such as the American AT&T, West German Siemens, and the French company Alcatel. Ericsson has no major domestic market to fall back on. It is precisely for this reason that the company has invested so much effort in gaining entry into markets throughout the world.

Several years ago Svedberg was hardly the most popular business leader among Swedish stockbrokers and financial analysts. The computer effort through Ericsson Information Systems brought major losses to the company. Now things are different. Ericsson stock has risen steadily to a new historic high.

How does it feel to win revenge on the stock market, so to speak?

"It feels great," the Svedberg said. The Swedish business leader had a gleam in his eye. He makes no secret of the fact that it was a tough period for Ericsson's management.

"But we must become even more profitable," the group's CEO said.

Is Ericsson shaping up to be the company of the 1990's in Sweden?

"It is up to others to decide that! But we will become even larger."

Will Ericsson look for a strategic partner?

"If you are thinking about what they call a 'mega-merger' in English, then the answer is no."

"Ericsson is a leading company in telecommunications. With our resources we will continue to develop this position until we actually become the international leader in this field," Svedberg said.

Ericsson has only 20 percent of its sales on the Swedish market. Moreover, 11 percent of its more than 30 billion Swedish kronor in sales is used for research and development.

Ericsson has been in Norway for several decades. The group has worked with Elektrisk Bureau [EB] for a long time and Ericsson has long been one of the major stockholders in that company. EB has marketed Ericsson's telephone exchanges, including products that are part of the large AXE series.

After the merger between the old EB, Asea Per Kure, and Nebb in the wake of the gigantic merger between Swedish Asea and the Swiss company Brown & Boverie, EB changed its emphasis. Telecommunications was no longer a natural part of EB. As a result, several months ago EB and Ericsson made an exchange: EB purchased a signals company from Ericsson, while Ericsson took over most of EB's telecommunications operations which, after all, were based on Ericsson technology. [passage omitted]

"Sweden was industrialized earlier than Norway, but Norwegians have a good tradition of training engineers," the Ericsson chief said. He spoke glowingly of the research environment surrounding the Norwegian Technical Institute in Trondheim and made no secret of the fact that his company is interested in exploring the possibility of working together with researchers there and at the central research facilities of the Telecommunications Network.

Svedberg is head of an information-oriented company that will face tough challenges during the coming years in the competition to attract the highly educated youth of tomorrow. [passage omitted]

You yourself are mentioned as a successor to the Werthen and Nicolin generation in the so-called Wallenberg sphere in Sweden. How do you react to speculation of this type?

"I do not participate in that type of speculation, but instead I devote my time to the Ericsson group. I speak with my board chairman Hans Werthen practically every day. He is an unusually vital man who still has many years in front of him as a leading figure in Swedish business." [passage omitted]

## SWEDEN

### Tele-X Satellite Gets First Customer

55002486 Stockholm DAGENS NYHETER in Swedish  
24 Aug 89 p 4

[Text] Rymdbolaget [The Swedish Space Agency] has now concluded its first contract with a customer for use of the Tele-X satellite's data communications system. The agency's first customer will be [Stockholm] AFTONBLADET. On Wednesday [23 August] a contract was

signed giving AFTONBLADET two bidirectional channels and the use of two ground stations for this traffic. The channels will be set up between AFTONBLADET's main editorial office in Stockholm and its printing plant in Goteborg. Pages ready for printing will be telefaxed via Tele-X for remote printing. The new fax line is part of AFTONBLADET's large plan to modernize its production.

## UNITED KINGDOM

### UK Calls for GaAs-Based Networks

*AN890257 Chichester INTERNATIONAL  
TELECOMMUNICATIONS INTELLIGENCE  
in English 7 Jul 89 pp 1-2*

[Article: "UK PCNs To Operate With GaAs Semiconductors—Do Potential Operators Have the Technology?"]

[Text] Micro-cellular personal communications networks (PCN) are "yet another demonstration of the British Government's enthusiasm for gallium arsenide integrated circuits," according to some industry watchers. They have noted that the key element in the new networks, scheduled to become operational around 1992, is the relaxation of current regulations on the use of point-to-point radio links to allow their use by PCN operators to effect cordless "local loop" connections between micro-cell base stations and the switched infrastructure. The Department of Trade and Industry (DTI) specified that these links must be in the "millimeter range of the radio frequency spectrum." That means they must operate at frequencies higher than 30 GHz, in turn implying the use of gallium arsenide-based semiconductors.

No details were given of the precise frequencies the DTI has in mind. However, in September 1988, the department issued a consultative "Green Paper" asking users and manufacturers to "contribute to the DTI's thinking" on the use of the spectrum above 30 GHz. This revealed that the DTI's Radio Regulatory Department "had identified two bands for early release to users." These bands were from 37 to 39.5 GHz and around 60 GHz.

The DTI stated earlier this year that it is considering the higher frequency for use in microwave television distribution systems. The September 1988 document revealed that the lower band had already been earmarked "for shared use by private users and public telecommunications operators on the basis of a low-cost relaxed specification currently being drafted."

Now after their first rash of enthusiasm, potential PCN operators are left wondering just where they will obtain this type of equipment before 1992 and how much they will have to pay for it.

The only equipment in regular use in British telecommunications networks is that used by the police and by Mercury to bring services quickly to heavy business users

in the City of London. It works at frequencies between 49.2 GHz and 50.2 GHz and is sourced from Japan.

But Len Lake, telecommunications engineer for Ewbank Preece Consulting Limited, says the NEC Pasolink equipment they use is designed to provide 2 Mbit/s data links and would need considerable modification to make it efficient for the transport of closely spaced, narrow-band voice channels. "And it is very expensive," he says.

According to the "Green Paper," there are "only two link equipments available in the UK which operate above 30 GHz." One is a portable electronic news gathering (ENG) system working at 40 GHz—but that provides only a one-way video link—and a point-to-point system operating at around 50 GHz. Both are believed to be relatively expensive.

British Telecom has shown prototypes of a potentially low-cost system for use at 29 GHz, but, intended for TV distribution, it is configured as a receive-only terminal at present. Nevertheless, BT is confident that using low-cost manufacturing techniques it has devised, the unit could be built in commercial volumes for a target price of less than 100 pounds. Ironically, British Telecom is barred from seeking a PCN operator's licence.

"Some British companies are also engaged in research and development work on military units," the Green Paper notes. But "this research may offer lower-cost spin-off parts for civil applications," it adds.

Heavy exploitation of the millimeter bands "must await the development of low-cost, solid-state microcircuits," the document states. However, it concludes that semiconductor device makers need the spur of large orders to stimulate investment in the development of suitable low-cost devices, and, in their turn, equipment builders will not develop low-cost systems until circuit prices drop. "It might take 10 years to break that cycle," the DTI believes.

Significantly, the DTI's announcement of the PCN licensing race stated that "PCNs provide a significant market opportunity for developing millimeter wavelength radio link technology for civilian applications."

Len Lake estimates that a PCN covering a 10-km radius would probably require some 20 pairs of link equipment to link its micro-cells with their switch. He says that at millimeter wavelengths, absorption by rain severely limits range, and allowing for worst case rainfall of two inches an hour, range would be restricted to little more than 1-2 km. He estimates a cost of 2,000 pounds per unit at present prices.

In addition to PCNs, link equipment of this type is also likely to find application in other areas. The DTI Green Paper suggested that 50,000 to 60,000 millimeter transceivers would be required to link EFTPOS terminals to banks by the early 1990s, and that "there might be a market for 1.2 million units in cordless PABX systems."

The DTI said "the long-term future of these millimeter-wave radio systems is critically dependent on the development of Gallium Arsenide microcircuits." Now it remains to be seen whether this market potential is enough to stimulate UK companies to invest in the enabling technologies.

Unfortunately, Britain's last remaining GaAs integrated circuit foundry at Towcester, Northants, was closed by Plessey just a month ago because the company could see no prospects of significant volume markets for its products.

### **British Telecom Scores Government Competition Policy**

55500114 London *THE DAILY TELEGRAPH*  
in English 20 Jul 89 p 26

[Article by Roland Gribben: "Competition Policy Attacked by Telecom"]

[Text] British Telecom warned yesterday that efforts to encourage competition is endangering its business and scope for expansion, and described parts of the Government's policy as misguided.

Iain Vallance, chairman, told MPs that current competition and regulatory policies and uncertainty about the future direction risked damaging the company.

"This pronounced tilt of the playing field in favour of British Telecom's competitors, whilst understandable in the initial market entry phase, is not in the long-term interests either of these competitors or of telecommunications users in the United Kingdom," said Mr Vallance in a memorandum submitted to the Trade and Industry Select Committee.

He denied later that BT was moaning but disclosed that he has made representations to Lord Young, Trade and

Industry Secretary about the problems. "I think there is a genuine acceptance that there are things that can be done to support BT's efforts," he added.

The attack, the strongest yet by the company on the Government's telecommunications competition policy, coincided with the release of a research report saying that BT will be forced to accelerate its overseas investment programme if it was squeezed further in the domestic market.

BT has become increasingly concerned by the change in rules and opening of new business as well as the "favourable" treatment being given to Mercury Communications.

Mr Vallance, in his memorandum, said there was an increasing tendency to apply artificial constraints to BT on the grounds that its dominance would threaten competition.

The approach was "misguided" because BT's domination was limited to fixed network operations. "Undue support" was being given to other competitors "irrespective of merit".

BT's image and influence overseas was being damaged through the "adverse reflection on its ability and performance". The restraints also cast doubt on the commercial justification of research and development and international standards and development work.

Increasing competition had not been matched by a reduction in regulation which had "tended to become increasingly pervasive and detailed".

The report on BT from the Telecommunications Research Centre echoed some of Mr Vallance's complaints and predicted that, over the next five years, the company could spend 2 billion pound sterling on further overseas acquisition and moves into operating telephone networks.

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